

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in this application:

Listing Of The Claims:

1-6. (Canceled).

7. (Currently Amended) An apparatus for detecting a vehicle rollover, comprising:
- a sensor arrangement suite for sensing vehicle dynamics data and rollover data;
- and
- a processor connected to the sensor ~~unit~~ arrangement, wherein the processor categorizes an operating state of the vehicle into one of a plurality of successive phases, and wherein the processor determines, for each phase, a float angle and a transverse vehicle velocity from the vehicle dynamics data and the rollover data, and wherein the vehicle rollover is detected based on the float angle and the transverse vehicle velocity.
8. (Currently Amended) The apparatus as recited in Claim 7, wherein the chronologically successive phases include a stable operating state, a breakaway state, and a skid state, wherein the stable operating state is characterized by a ~~substantially~~ constant value of the float angle, the breakaway state is characterized by ~~a large change~~ an increase in the float angle by at least 20 degrees, and the skid state is characterized as occurring after the breakaway state has occurred and where the vehicle is skidding and ~~by a value of the float angle~~ has a value that is greater than a predefined threshold value.
9. (Previously Presented) The apparatus as recited in Claim 7, wherein the vehicle dynamics data includes at least one of a longitudinal vehicle velocity, a yaw rate and a transverse vehicle acceleration.
10. (Previously Presented) The apparatus as recited in Claim 8, wherein the vehicle dynamics data includes at least one of a longitudinal vehicle velocity, a yaw rate and a transverse vehicle acceleration.
11. (Currently Amended) The apparatus as recited in Claim 9, wherein the sensor arrangement suite additionally detects and outputs at least one of a wheel rotational speed, a longitudinal vehicle acceleration, a steering angle, and an estimate of the float angle.

12. (Currently Amended) The apparatus as recited in Claim 10, wherein the sensor arrangement suite additionally detects and outputs at least one of a wheel rotational speed, a longitudinal vehicle acceleration, a steering angle, and an estimate of the float angle.

13. (Previously Presented) The apparatus as recited in Claim 7, wherein the apparatus is connected to a restraint system that is activated by the processor based on the detection of the rollover.

14. (Previously Presented) The apparatus as recited in Claim 8, wherein the apparatus is connected to a restraint system that is activated by the processor based on the detection of the rollover.

15. (Previously Presented) The apparatus as recited in Claim 9, wherein the apparatus is connected to a restraint system that is activated by the processor based on the detection of the rollover.

16. (Previously Presented) The apparatus as recited in Claim 10, wherein the apparatus is connected to a restraint system that is activated by the processor based on the detection of the rollover.

17. (Previously Presented) The apparatus as recited in Claim 11, wherein the apparatus is connected to a restraint system that is activated by the processor based on the detection of the rollover.

18. (Previously Presented) The apparatus as recited in Claim 12, wherein the apparatus is connected to a restraint system that is activated by the processor based on the detection of the rollover.

19. (Currently Amended) An apparatus for detecting a vehicle rollover, comprising:
a sensor arrangement suite for sensing vehicle dynamics data and rollover data;
and

a processor connected to the sensor ~~unit~~ arrangement, wherein the processor categorizes an operating state of the vehicle into one of a plurality of successive phases, and wherein the processor determines, for each phase, a float angle and a vehicle center-of-mass velocity from the vehicle dynamics data and the rollover data, and wherein the vehicle rollover is detected based on the float angle and the vehicle center-of-mass velocity.

20. (Currently Amended) The apparatus as recited in Claim 19, wherein the chronologically successive phases include a stable operating state, a breakaway state, and a skid state,

wherein the stable operating state is characterized by a ~~substantially~~ constant value of the float angle, the breakaway state is characterized by ~~a large change~~ an increase in the float angle by at least 20 degrees, and the skid state is characterized as occurring after the breakaway state has occurred and where the vehicle is skidding and ~~by a value of the float angle~~ has a value that is greater than a predefined threshold value.

21. (Previously Presented) The apparatus as recited in Claim 19, wherein the vehicle dynamics data includes at least one of a longitudinal vehicle velocity, a yaw rate and a transverse vehicle acceleration.

22. (Previously Presented) The apparatus as recited in Claim 20, wherein the vehicle dynamics data includes at least one of a longitudinal vehicle velocity, a yaw rate and a transverse vehicle acceleration.

23. (Currently Amended) The apparatus as recited in Claim 21, wherein the sensor arrangement suite additionally detects and outputs at least one of a wheel rotational speed, a longitudinal vehicle acceleration, a steering angle, and an estimate of the float angle.

24. (Currently Amended) The apparatus as recited in Claim 22, wherein the sensor arrangement suite additionally detects and outputs at least one of a wheel rotational speed, a longitudinal vehicle acceleration, a steering angle, and an estimate of the float angle.

25. (Previously Presented) The apparatus as recited in Claim 22, wherein the apparatus is connected to a restraint system that is activated by the processor based on the detection of the rollover.

26. (Previously Presented) The apparatus as recited in Claim 24, wherein the apparatus is connected to a restraint system that is activated by the processor based on the detection of the rollover.